

SEQUENCE LISTING

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<120> PLASTID-TARGETING PEPTIDE

<130> MJPbv1516/7

<150> FR 02 07729

<151> 2002-06-21

<160> 18

<170> PatentIn version 3.1

<210> 1

<211> 329

<212> PRT

<213> Arabidopsis thaliana

<400> 1

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1

5

10

15

Gly Ala Ala Gly Leu Glu His Val Gln Val Pro Val Pro Thr Pro Lys

20

25

30

Ser Asn Glu Val Cys Leu Lys Leu Glu Ala Thr Ser Leu Asn Pro Val

35

40

45

Asp Trp Lys Ile Gln Lys Gly Met Ile Arg Pro Phe Leu Pro Arg Lys

50

55

60

Phe Pro Cys Ile Pro Ala Thr Asp Val Ala Gly Glu Val Val Glu Val
 65 70 75 80
 Gly Ser Gly Val Lys Asn Phe Lys Ala Gly Asp Lys Val Val Ala Val
 85 90 95
 Leu Ser His Leu Gly Gly Gly Gly Leu Ala Glu Phe Ala Val Ala Thr
 100 105 110
 Glu Lys Leu Thr Val Lys Arg Pro Gln Glu Val Gly Ala Ala Glu Ala
 115 120 125
 Ala Ala Leu Pro Val Ala Gly Leu Thr Ala Leu Gln Ala Leu Thr Asn
 130 135 140
 Pro Ala Gly Leu Lys Leu Asp Gly Thr Gly Lys Lys Ala Asn Ile Leu
 145 150 155 160
 Val Thr Ala Ala Ser Gly Gly Val Gly His Tyr Ala Val Gln Leu Ala
 165 170 175
 Lys Leu Ala Asn Ala His Val Thr Ala Thr Cys Gly Ala Arg Asn Ile
 180 185 190
 Glu Phe Val Lys Ser Leu Gly Ala Asp Glu Val Leu Asp Tyr Lys Thr
 195 200 205
 Pro Glu Gly Ala Ala Leu Lys Ser Pro Ser Gly Lys Lys Tyr Asp Ala
 210 215 220
 Val Val His Cys Ala Asn Gly Ile Pro Phe Ser Val Phe Glu Pro Asn
 225 230 235 240
 Leu Ser Glu Asn Gly Lys Val Ile Asp Ile Thr Pro Gly Pro Asn Ala
 245 250 255
 Met Trp Thr Tyr Ala Val Lys Lys Ile Thr Met Ser Lys Lys Gln Leu
 260 265 270
 Val Pro Leu Leu Leu Ile Pro Lys Ala Glu Asn Leu Glu Phe Met Val
 275 280 285
 Asn Leu Val Lys Glu Gly Lys Val Lys Thr Val Ile Asp Ser Lys His
 290 295 300
 Pro Leu Ser Lys Ala Glu Asp Ala Trp Ala Lys Ser Ile Asp Gly His
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 Ala Thr Gly Lys Ile Ile Val Glu Pro
 325

<210> 2

<211> 1228

<212> DNA

<213> *Spinacia oleracea*

<400> 2

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ctgatccaaa gtctgatgag ttattgctta aaattgaggc tgcaactttg aaccaattg      240
attggaagat tcagaagggt gtacttcgtc ccctcttacc ccgcaagttc cctactatac      300
ctggaactga tgttgctggg gaggtagtcc aggctggatc tgctgtaaat aggtttaaaa      360
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ccgtggcgaa ggagaacctg acagttgcta gaccaccaga agtatcagca gcagaagggtg      480
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aaaagcagct ggtgcctctg cttttgatac caaagatccc caactttgaa tatgttgatga      960
atttggtaaa ggaaaagaag cttaaaacag tcatagactc taaacatccc ttgagtaaag     1020
gtgaagatgc ttggagtagg ataatgggtg gtcatgctac agggaagatt ataatcgagc     1080
cttgaataga aaatattgat gcagacccgc tatatattgc ttgaagggtta caaactttta     1140
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<210> 3

<211> 329

<212> PRT

<213> *Spinacia oleracea*

<400> 3

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20           25           30
Ser Asp Glu Leu Leu Leu Lys Ile Glu Ala Ala Thr Leu Asn Pro Ile
35           40           45

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Asp Trp Lys Ile Gln Lys Gly Val Leu Arg Pro Leu Leu Pro Arg Lys
 50 55 60
 Phe Pro Thr Ile Pro Gly Thr Asp Val Ala Gly Glu Val Val Gln Ala
 65 70 75 80
 Gly Ser Ala Val Asn Arg Phe Lys Thr Gly Asp Lys Val Val Ala Val
 85 90 95
 Leu Ser His Ala Thr Gly Gly Ala Leu Ala Glu Tyr Ala Val Ala Lys
 100 105 110
 Glu Asn Leu Thr Val Ala Arg Pro Pro Glu Val Ser Ala Ala Glu Gly
 115 120 125
 Ala Ala Leu Pro Val Ala Ala Leu Thr Ala His Gln Ala Leu Thr Gln
 130 135 140
 Phe Ala Asn Ile Lys Leu Asp Gly Ser Gly Glu Arg Lys Asn Ile Leu
 145 150 155 160
 Ile Thr Ala Ala Ser Gly Gly Val Gly His Tyr Ala Val Gln Leu Ala
 165 170 175
 Lys Leu Gly Asn Thr His Val Thr Ala Thr Cys Gly Ala Arg Asn Leu
 180 185 190
 Asp Phe Val Lys Gly Leu Gly Ala Asp Glu Val Leu Asp Tyr Lys Thr
 195 200 205
 Pro Glu Gly Ala Ser Leu Thr Ser Pro Ser Gly Lys Lys Tyr Asp Tyr
 210 215 220
 Val Val His Gly Ala Ser Gly Ile Pro Trp Ser Thr Phe Glu Pro Asn
 225 230 235 240
 Leu Ser Glu Ala Gly Lys Val Ile Asp Leu Thr Pro Gly Pro Thr Ala
 245 250 255
 Met Met Thr Phe Ala Trp Lys Lys Leu Thr Phe Ser Lys Lys Gln Leu
 260 265 270
 Val Pro Leu Leu Leu Ile Pro Lys Ile Pro Asn Phe Glu Tyr Val Val
 275 280 285
 Asn Leu Val Lys Glu Lys Lys Leu Lys Thr Val Ile Asp Ser Lys His
 290 295 300
 Pro Leu Ser Lys Gly Glu Asp Ala Trp Ser Arg Ile Met Gly Gly His
 305 310 315 320
 Ala Thr Gly Lys Ile Ile Ile Glu Pro
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<210> 4
 <211> 61
 <212> PRT
 <213> *Arabidopsis thaliana*

<400> 4

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Leu Glu Ala Thr Ser Leu Asn Pro Val Asp Trp Lys Ile Gln Lys Gly
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Met Ile Arg Pro Phe Leu Pro Arg Lys Phe Pro Cys Ile Pro Ala Thr
           20           25           30
Asp Val Ala Gly Glu Val Val Glu Val Gly Ser Gly Val Lys Asn Phe
           35           40           45
Lys Ala Gly Asp Lys Val Val Ala Val Leu Ser His Leu
           50           55           60

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<210> 5
 <211> 61
 <212> PRT
 <213> *Spinacia oleracea*

<400> 5

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Ile Glu Ala Ala Thr Leu Asn Pro Ile Asp Trp Lys Ile Gln Lys Gly
1           5           10           15
Val Leu Arg Pro Leu Leu Pro Arg Lys Phe Pro Thr Ile Pro Gly Thr
           20           25           30
Asp Val Ala Gly Glu Val Val Gln Ala Gly Ser Ala Val Asn Arg Phe
           35           40           45
Lys Thr Gly Asp Lys Val Val Ala Val Leu Ser His Ala
           50           55           60

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<210> 6
 <211> 327
 <212> PRT
 <213> *Escherichia coli*

<400> 6

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Met Ala Thr Arg Ile Glu Phe His Lys His Gly Gly Pro Glu Val Leu
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          20           25           30
Val Glu Asn Lys Ala Ile Gly Ile Asn Phe Ile Asp Thr Tyr Ile Arg
          35           40           45
Ser Gly Leu Tyr Pro Pro Pro Ser Leu Pro Ser Gly Leu Gly Thr Glu
          50           55           60
Ala Ala Gly Ile Val Ser Lys Val Gly Ser Gly Val Lys His Ile Lys
65           70           75           80
Ala Gly Asp Arg Val Val Tyr Ala Gln Ser Ala Leu Gly Ala Tyr Ser
          85           90           95
Ser Val His Asn Ile Ile Ala Asp Lys Ala Ala Ile Leu Pro Ala Ala
          100          105          110
Ile Ser Phe Glu Gln Ala Ala Ala Ser Phe Leu Lys Gly Leu Thr Val
          115          120          125
Tyr Tyr Leu Leu Arg Lys Thr Tyr Glu Ile Lys Pro Asp Glu Gln Phe
          130          135          140
Leu Phe His Ala Ala Ala Gly Gly Val Gly Leu Ile Ala Cys Gln Trp
145          150          155          160
Ala Lys Ala Leu Gly Ala Lys Leu Ile Gly Thr Val Gly Thr Ala Gln
          165          170          175
Lys Ala Gln Ser Ala Leu Lys Ala Gly Ala Trp Gln Val Ile Asn Tyr
          180          185          190
Arg Glu Glu Asp Leu Val Glu Arg Leu Lys Glu Ile Thr Gly Gly Lys
          195          200          205
Lys Val Arg Val Val Tyr Asp Ser Val Gly Arg Asp Thr Trp Glu Arg
          210          215          220
Ser Leu Asp Cys Leu Gln Arg Arg Gly Leu Met Val Ser Phe Gly Asn
225          230          235          240
Ser Ser Gly Ala Val Thr Gly Val Asn Leu Gly Ile Leu Asn Gln Lys
          245          250          255
Gly Ser Leu Tyr Val Thr Arg Pro Ser Leu Gln Gly Tyr Ile Thr Thr
          260          265          270
Arg Glu Glu Leu Thr Glu Ala Ser Asn Glu Leu Phe Ser Leu Ile Ala
          275          280          285

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Ser Gly Val Ile Lys Val Asp Val Ala Glu Gln Gln Lys Tyr Pro Leu
 290 295 300
 Lys Asp Ala Gln Arg Ala His Glu Ile Leu Glu Ser Arg Ala Thr Gln
 305 310 315 320
 Gly Ser Ser Leu Leu Ile Pro
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<210> 7
 <211> 334
 <212> PRT
 <213> *saccharomyces cerevisiae*

<400> 7

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 20 25 30
 Ile Ser Glu Glu Glu Leu Leu Ile Lys Asn Lys Tyr Thr Gly Val Asn
 35 40 45
 Tyr Ile Glu Ser Tyr Phe Arg Lys Gly Ile Tyr Pro Cys Glu Lys Pro
 50 55 60
 Tyr Val Leu Gly Arg Glu Ala Ser Gly Thr Val Val Ala Lys Gly Lys
 65 70 75 80
 Gly Val Thr Asn Phe Glu Val Gly Asp Gln Val Ala Tyr Ile Ser Asn
 85 90 95
 Ser Thr Phe Ala Gln Tyr Ser Lys Ile Ser Ser Gln Gly Pro Val Met
 100 105 110
 Lys Leu Pro Lys Gly Thr Ser Asp Glu Glu Leu Lys Leu Tyr Ala Ala
 115 120 125
 Gly Leu Leu Gln Val Leu Thr Ala Leu Ser Phe Thr Asn Glu Ala Tyr
 130 135 140
 His Val Lys Lys Gly Asp Tyr Val Leu Leu Phe Ala Ala Ala Gly Gly
 145 150 155 160
 Val Gly Leu Ile Leu Asn Gln Leu Leu Lys Met Lys Gly Ala His Thr
 165 170 175
 Ile Ala Val Ala Ser Thr Asp Glu Lys Leu Lys Ile Ala Lys Glu Tyr
 180 185 190

Gly Ala Glu Tyr Leu Ile Asn Ala Ser Lys Glu Asp Ile Leu Arg Gln
 195 200 205
 Val Leu Lys Phe Thr Asn Gly Lys Gly Val Asp Ala Ser Phe Asp Ser
 210 215 220
 Val Gly Lys Asp Thr Phe Glu Ile Ser Leu Ala Ala Leu Lys Arg Lys
 225 230 235 240
 Gly Val Phe Val Ser Phe Gly Asn Ala Ser Gly Leu Ile Pro Pro Phe
 245 250 255
 Ser Ile Thr Arg Leu Ser Pro Lys Asn Ile Thr Leu Val Arg Pro Gln
 260 265 270
 Leu Tyr Gly Tyr Ile Ala Asp Pro Glu Glu Trp Lys Tyr Tyr Ser Asp
 275 280 285
 Glu Phe Phe Gly Leu Val Asn Ser Lys Lys Leu Asn Ile Lys Ile Tyr
 290 295 300
 Lys Thr Tyr Pro Leu Arg Asp Tyr Arg Thr Ala Ala Ala Asp Ile Glu
 305 310 315 320
 Ser Arg Lys Thr Val Gly Lys Leu Val Leu Glu Ile Pro Gln
 325 330

<210> 8
 <211> 329
 <212> PRT
 <213> *Cavia porcellus*

<400> 8

Met Ala Thr Gly Gln Lys Leu Met Arg Ala Ile Arg Val Phe Glu Phe
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 20 25 30
 Pro Lys Asp His Gln Val Leu Ile Lys Val His Ala Cys Gly Ile Asn
 35 40 45
 Pro Val Glu Thr Tyr Ile Arg Ser Gly Thr Tyr Thr Arg Ile Pro Leu
 50 55 60
 Leu Pro Tyr Thr Pro Gly Thr Asp Val Ala Gly Val Val Glu Ser Ile
 65 70 75 80
 Gly Asn Asp Val Ser Ala Phe Lys Lys Gly Asp Arg Val Phe Thr Thr
 85 90 95

Ser Thr Ile Ser Gly Gly Tyr Ala Glu Tyr Ala Leu Ala Ser Asp His
 100 105 110
 Thr Val Tyr Arg Leu Pro Glu Lys Leu Asp Phe Arg Gln Gly Ala Ala
 115 120 125
 Ile Gly Ile Pro Tyr Phe Thr Ala Cys Arg Ala Leu Phe His Ser Ala
 130 135 140
 Arg Ala Lys Ala Gly Glu Ser Val Leu Val His Gly Ala Ser Gly Gly
 145 150 155 160
 Val Gly Leu Ala Ala Cys Gln Ile Ala Arg Ala Tyr Gly Leu Lys Val
 165 170 175
 Leu Gly Thr Ala Gly Thr Glu Glu Gly Gln Lys Val Val Leu Gln Asn
 180 185 190
 Gly Ala His Glu Val Phe Asn His Arg Asp Ala His Tyr Ile Asp Glu
 195 200 205
 Ile Lys Lys Ser Ile Gly Glu Lys Gly Val Asp Val Ile Ile Glu Met
 210 215 220
 Leu Ala Asn Val Asn Leu Ser Asn Asp Leu Lys Leu Leu Ser Cys Gly
 225 230 235 240
 Gly Arg Val Ile Ile Val Gly Cys Arg Gly Ser Ile Glu Ile Asn Pro
 245 250 255
 Arg Asp Thr Met Ala Lys Glu Ser Thr Ile Ser Gly Val Ser Leu Phe
 260 265 270
 Ser Ser Thr Lys Glu Glu Phe Gln Gln Phe Ala Ser Thr Ile Gln Ala
 275 280 285
 Gly Met Glu Leu Gly Trp Val Lys Pro Val Ile Gly Ser Gln Tyr Pro
 290 295 300
 Leu Glu Lys Ala Ser Gln Ala His Glu Asn Ile Ile His Ser Ser Gly
 305 310 315 320
 Thr Val Gly Lys Thr Val Leu Leu Met
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<210> 9

<211> 331

<212> PRT

<213> Mus musculus

<400> 9

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 20 25 30
 Pro Gln Ser His Gln Val Leu Ile Lys Val His Ala Cys Gly Val Asn
 35 40 45
 Pro Val Glu Thr Tyr Ile Arg Ser Gly Ala Tyr Ser Arg Lys Pro Ala
 50 55 60
 Leu Pro Tyr Thr Pro Gly Ser Asp Val Ala Gly Ile Ile Glu Ser Val
 65 70 75 80
 Gly Asp Lys Val Ser Ala Phe Lys Lys Gly Asp Arg Val Phe Cys Tyr
 85 90 95
 Ser Thr Val Ser Gly Gly Tyr Ala Glu Phe Ala Leu Ala Ala Asp Asp
 100 105 110
 Thr Ile Tyr Pro Leu Pro Glu Thr Leu Asn Phe Arg Gln Gly Ala Ala
 115 120 125
 Leu Gly Ile Pro Tyr Phe Thr Ala Cys Arg Ala Leu Phe His Ser Ala
 130 135 140
 Arg Ala Arg Ala Gly Glu Ser Val Leu Val His Gly Ala Ser Gly Gly
 145 150 155 160
 Val Gly Leu Ala Thr Cys Gln Ile Ala Arg Ala His Gly Leu Lys Val
 165 170 175
 Leu Gly Thr Ala Gly Ser Glu Glu Gly Lys Lys Leu Val Leu Gln Asn
 180 185 190
 Gly Ala His Glu Val Phe Asn His Lys Glu Ala Asn Tyr Ile Asp Lys
 195 200 205
 Ile Lys Met Ser Val Gly Asp Lys Asp Lys Gly Val Asp Val Ile Ile
 210 215 220
 Glu Met Leu Ala Asn Glu Asn Leu Ser Asn Asp Leu Lys Leu Leu Ser
 225 230 235 240
 His Gly Gly Arg Val Val Val Val Gly Cys Arg Gly Pro Ile Glu Ile
 245 250 255
 Asn Pro Arg Asp Thr Met Ala Lys Glu Thr Ser Ile Ile Gly Val Ser
 260 265 270
 Leu Ser Ser Ser Thr Lys Glu Glu Phe Gln Gln Phe Ala Gly Leu Leu
 275 280 285
 Gln Ala Gly Ile Glu Lys Gly Trp Val Lys Pro Val Ile Gly Ser Glu
 290 295 300

Tyr Pro Leu Glu Lys Ala Ala Gln Ala His Glu Asp Ile Ile His Gly
 305 310 315 320

Ser Gly Lys Thr Gly Lys Met Ile Leu Leu Leu
 325 330

<210> 10

<211> 28

<212> DNA

<213> Artificial sequence

<220>

<223> PCR primer

<400> 10

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<211> 27

<212> DNA

<213> Artificial sequence

<220>

<223> PCR primer

<400> 11

27

arggatccaa cgctcttatg gctcgac

<210> 12

<211> 30

<212> DNA

<213> Artificial sequence

<220>

<223> PCR primer

<400> 12

30

cctctcgaga tggctggaaa actcatgcac

<210> 13
<211> 30
<212> DNA
<213> Artificial sequence

<220>

<223> PCR primer

<400> 13

30

caacccatgg atggctcgac aatgatcttc

<210> 14
<211> 35
<212> DNA
<213> Artificial sequence

<220>

<223> PCR primer

<400> 14

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<210> 15
<211> 32
<212> DNA
<213> Artificial sequence

<220>

<223> PCR primer

<400> 15

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<210> 16
<211> 32
<212> DNA
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<220>

<223> PCR primer

<400> 16

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32

<210> 17

<211> 31

<212> DNA

<213> Artificial sequence

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<223> PCR primer

<400> 17

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31

<210> 18

<211> 30

<212> DNA

<213> Artificial sequence

<220>

<223> PCR primer

<400> 18

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